

R E P O R T S .
TO THE
LOCAL GOVERNMENT BOARD
ON
PUBLIC HEALTH AND MEDICAL
MATTERS.

(NEW SERIES No. 3.)

Dr. R. Deane Sweeting's Report to the Local Government Board on the sanitary circumstances and administration of the County Borough of Rotherham, with special reference to the continued prevalence of Enteric Fever.



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1909.

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ARTHUR NEWSHOLME,

Medical Officer,

April 2nd, 1909.

This inquiry was ordered owing to the persistence of enteric fever in the borough of Rotherham, as shown in the quarterly returns of the Registrar-General; and to the receipt of a special report by the medical officer of health on the same subject.

Rotherham borough, situated north-east of, and at one point adjoining, the City of Sheffield, is bounded on the north by Greasborough and Rawmarsh Urban Districts and by the parish of Wentworth in the Rotherham Rural District, on the east and south by Rotherham Rural District, and on the west by Wortley Rural District. It is in the basin of the river Don and of its tributary the Rother—the former stream entering the borough at the south-west and traversing it obliquely to the east, the latter entering the borough at the south and joining the Don at Bow Bridge in the middle of the borough. Placed on three hills which converge to the Don, the elevation of the borough ranges from about 80 feet above ordnance datum on the banks of the Don in the centre to 480 feet in the north-west.

The area of the borough is 6,012 acres; population in 1891, 42,061; in 1901, 54,349; now estimated at 64,072.

The number of inhabited houses was 7997 in 1891; 10,804 in 1901; and is now estimated at 12,491.

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The borough is divided into nine wards, of which certain particulars are given in the following Table A, supplied by the Medical Officer of Health:—

Table (A) giving the Acreage, Estimated Population, and Number of Inhabited Houses in 1908, and the Population per Acre and per House in each Ward of the Borough of Rotherham.

Ward.	Acreage.	Population (estimated for 1908).*	Population per Acre (density).	Inhabited Houses (1908).*	Population per House.
East	480	5,485	11·4	1,072	5·1
St. Ann's	131	7,481	57·1	1,471	5·0
Clifton	524	5,664	10·8	1,104	5·0
South	436	6,768	15·5	1,322	5·1
West	530	5,353	10·1	1,048	5·1
North	318	8,343	26·2	1,607	5·1
Thornhill	196	8,356	42·6	1,625	5·1
Masborough	412	8,634	21·0	1,691	5·1
Kimberworth	2,985	7,988	2·7	1,551	5·1
Whole Borough	6,012	64,072	10·7	12,491	5·1

* These are rough estimates of the Medical Officer of Health. The 1901 census figures are not inserted, as in that year the Borough was divided into only six Wards.

From this it appears that St. Ann's and Thornhill Wards are the most dense, Kimberworth and West Wards the least dense. According to the table, which, however, is largely based upon rough estimates, no ward shows an appreciably greater average population per house than any other.

Of these wards, Kimberworth is purely rural in character, and contains a few villages and hamlets, such as Thorpe Hesley, Scholes, Blackburn and Kimberworth. Considerable portions of East, Clifton and South Wards are also of rural character, chiefly on their eastern and more remote side.

The geological formation upon which the borough is placed is the middle coal measures: a conspicuous bed of red sandstone rock belonging to this series crops out on the surface in several places: along the Rivers Don and Rother is a bed of alluvial deposit.

The chief industries are coal-mining, steel and iron works, and brass-foundries.

The gross rateable value is £275,750: the assessable value for borough rate £212,144: the nett assessable value for general district rate £191,097.

The total indebtedness of the borough is at present (a) under the Public Health Acts, £291,551: (b) under local Acts, £463,311.

Rotherham was incorporated as a municipal borough by Royal Charter in 1871. It was made a County Borough in 1902, after application to and inquiry by the Board.

There have been several previous official inspections of Rotherham, and thrice before has the prevalence of enteric fever been made the occasion of inquiry. Thus, the townships of Rotherham

and Kimberworth were inspected and reported upon in 1850 by Mr. Lee, C.E., Superintending Inspector of the General Board of Health, with especial reference to sewerage, drainage and water supply. Mr. Lee in his report, *inter alia*, speaks of "low typhoid fever" being "almost constantly present, in certain localities." Then, Dr. Ord, on behalf of the Privy Council, inspected Rotherham on account of the prevalence of "fever and jaundice" in 1862, and his report appears in the sixth report of the Medical Officer of the Privy Council. In this report, Dr. Ord incidentally refers to the prevalence of cholera at Rotherham in 1832 and 1853. The chief sanitary defects noted by him at Rotherham in 1862 were deficiency of privy accommodation, neglect of scavenging, badly ventilated (often back-to-back) houses, and the condition of the River Don. On behalf of the Board, Rotherham has been inspected, in 1872 by Dr. Ballard for enteric fever, by Dr. Thomson for this disease in 1891, and for cholera in 1893; whilst Dr. Davies reported upon its sanitary condition in 1886 during the general sanitary survey of that year. The following is the *précis* of Dr. Thomson's 1891 inquiry, which included investigation into enteric fever in Rawmarsh and Greasborough urban districts, as well as in Rotherham:—

"Simultaneous outbreaks of enteric fever and of fever of a less definite sort, in each of these three districts. These outbreaks not due to sewerage or drainage, nor to excrement disposal nor to milk supply, but to a public water supply common to the invaded parts of each district. The public supply in question that known as the 'high level' section of the Rotherham water works. This section of the water supply shown to have been similarly related to 'fever' prevalence in previous years."

I shall have occasion to refer again to Dr. Thomson's report, in considering the present water supply of the borough.

The following is a description of the chief sanitary circumstances of the borough of Rotherham.

Roads.—There are 8 miles 6 furlongs of main roads, and 49 miles 7 furlongs of secondary roads within the borough. Nearly all streets which have been made up by owners under section 152 of the Public Health Act, 1875, have been taken over as highways repairable by the inhabitants. But there still remain a considerable number of streets that have not been made up, and their condition leaves a good deal to be desired. The Private Street Works Act of 1892 has not been adopted by the Corporation.

Dwellings and yards.—In some parts of the centre of the borough, especially in St. Ann's and Thornhill Wards, there is undue aggregation of dwellings upon area. Many houses hereabouts have very narrow curtilages attached to them. Overcrowding of persons in dwellings is not uncommon, and necessitates close supervision. During my inspection I came across many cases on the border-line of overcrowding. As seen later, the female health visitor looks after this matter.

The vast bulk of dwellings is inhabited by working class folk. The houses are generally of brick, and slated; with usually four rooms, two on a floor. Many of the older dwellings have damp

walls, whether from their position (*e.g.*, built up against banks), from inadequacy of eave-spouting, or from absence of damp-proof courses. Dilapidated ceilings, walls, floors, and staircases are to be found abundantly in much of the older property of the borough. Many houses are exceedingly dirty. Some are dark. There are a few cellar dwellings remaining.

Numerous back-to-back houses exist in Rotherham, though their erection is not now permitted. They total 359 now, and are found in six of the nine wards of the borough; but chiefly in Masborough and Thornhill Wards, which have, respectively, 145 and 118 of such dwellings. In addition to these back-to-back houses, there are numerous other houses with no through ventilation at all, and not a few with through ventilation on the first floor only. Since 1892 only 137 houses have been demolished under the Housing of the Working Classes Act of 1890. These have been mostly in the West Ward (44 demolitions) and South Ward (37 demolitions). No areas at all have been dealt with under this Act since the above date, in spite of the urgent need there has been for dealing with dense areas and back-to-back property in the borough. There are numerous tenement houses; but though byelaws with respect to them have been adopted and confirmed, these are not enforced. No register is kept of tenements; but from a recent return there are 130 furnished tenements, chiefly in Masborough Ward. There are many others unfurnished, the number of which is not known.

The condition of back yards, as a rule, leaves much to be desired. The majority are badly and irregularly paved: usually tarpaving is used, which appears very apt to become broken up into holes, in which mud collects. Some are not paved at all. Water, and sometimes slops, are to be found lying about yards, as well as house refuse of various sorts, owing to defective disposal, to be presently referred to. The practice is common of keeping animals (*e.g.*, fowls, ducks, and pigeons) in these back yards. Constant inspection is necessary, to prevent these becoming a nuisance. The repression of this practice is not as vigorously undertaken as it might be.

Water supply.—At Dr. Thomson's inspection in 1891 the high-level service, to which he attributed the outbreak of enteric fever in Rotherham, Rawmarsh and Greasborough, was derived from the Ulley gathering ground, the Wellgate Spring, and the Pinch Mill Spring. The low-level service was derived from the Dalton gathering ground and the Aldwarke Spring.

Since that date, all these sources save the Pinch Mill Spring have been more or less abandoned. Thus, the Wellgate Spring was disused in 1894, the Ulley gathering ground was "temporarily discontinued" in 1905, the Dalton gathering ground was discontinued in 1906, and the Aldwarke Spring in 1908. In view of the apparent intention of the Corporation not to wholly abandon the Ulley gathering ground, it should be said that, though improvement has undoubtedly taken place in this area by the sewerage of Aughton and Aston, for which loans were sanctioned by the Board in 1899 and 1903, there still exists appreciable danger to this watershed from cesspool overflows in

Morthen, Brampton, and Ulley; and that, until these potential sources of injury have been dealt with, the question of resuming use of the Ulley water should not be entertained. In this connexion it might be stated that an agreement signed in 1896 between the Corporation and the Rural District Council of Rotherham, whereby the former body undertook to drain Ulley, has not yet been carried out by the Corporation.

On the other hand, the Corporation disclaim any intention of resuming use of the Dalton gathering ground, since they regard this area as hopelessly polluted by trade refuse, chiefly, as I was informed, sulpho-cyanide of copper, a product of coal tar distillation, from a large colliery in this watershed. Indeed, legal action, with a view to obtaining compensation from the colliery company for the loss of the watershed, is seriously contemplated by the Corporation. Besides this trade refuse, which enters the Silverwood stream in this Dalton gathering ground, sewage still apparently enters other streams in this area from two isolated farmhouses and from Dalton Magna. Dalton Parva is now drained.

Of the old sources of water supply in 1891, only one, therefore, now remains, viz., Pinch Mill Spring. This has been in use since 1864. The water of this spring issues from between the sandstone and shale at a point some 3 miles south-east of Rotherham, and three-quarters of a mile south of Wickersley village in the Rotherham Rural District. The sandstone here is about 100 feet thick, and covers an area of about 3 square miles. The base of the sandstone bed slopes towards the spring. From the above point the water is piped through the village of Whiston, which it supplies on the way, and thence to the central pumping station at Rotherham. Here it is pumped to the Thorpe reservoir in Kimberworth Ward in the north-west of the borough, whence it descends by gravitation. Chemical analyses of this water during the last three years have shown the repeated presence of fairly large quantities of nitrates, ranging from '14 to '91 grains per gallon of oxidised nitrogen, or from '54 to 3'51 grains of anhydrous nitric acid. The chlorine, however, has been low in the same specimens, ranging from one to 2'10 grains per gallon. With regard to the presence of these nitrates, it is noteworthy that the lower and most southern portion of Wickersley village, comprising some 40 to 50 houses, is undrained; and that the overflow from cesspools and sumps hereabouts and leakage from wet middens passes, either directly or by way of ditches, to certain disused sandstone quarries in the vicinity of this end of the village. This sandstone is much fissured. It is, therefore, not improbable that the presence of nitrates in these quantities in the Pinch Mill spring water may be referable to gradual and prolonged contamination of the ground by foul matter, the oxidised products of which percolate to the spring along and through this porous and fissured sandstone between Wickersley village and the origin of the spring. There are also a few cultivated fields between Wickersley and the spring, which may contribute nitrates to some extent. No bacteriological analyses of this water have yet been made. The yield of Pinch Mill spring is 120,000 gallons a day. This water supplies constantly the greater part

of Kimberworth Ward, viz.:—Thorpe Hesley, Scholes, and part of Kimberworth villages, as well as isolated houses in the ward, all being the highest parts of the borough.

Since August, 1905, the rest of Kimberworth Ward and the other wards of the borough have been supplied constantly with water from the Langsett reservoir, some 15 miles north-west of Sheffield. The high-level parts of the borough are fed from Boston Castle reservoir, the low-level parts from Cranworth reservoir. By virtue of the Sheffield Corporation Act of 1896, Rotherham shares the water from this reservoir along with Sheffield and Doncaster Boroughs, paying 8/31 of the cost, *plus* maintenance charges. At Langsett reservoir, the cubic capacity of which is 1,408 million gallons, upland surface water is impounded. The gathering ground is moorland country: it seems singularly free from danger of sewage contamination, the few habitations upon it draining into another watershed. There is a compensation reservoir holding 600,000 gallons. Chalk filtration is being got ready, in order to remove slight yellow turbidity, which makes the water unpopular, and to guard against possible lead poisoning from this water. Rotherham receives 1,600,000 gallons per day of this Langsett water, making, with that of Pinch Mill spring, 1,720,000 gallons a day, or some 25 gallons per head of population. But, since so much water is used in the borough for trade purposes, the above quantity is held to be barely sufficient, and shortage has been complained of in several parts of Rotherham. Indeed, Langsett water, in a central area, comprising the greater part of the West, Masborough, Thornhill, and St. Ann's Wards, has to be supplemented about once in every 20 days by Pinch Mill spring water. The chemical analyses of Langsett water have been very favourable.

Rotherham, however, is in future to share in the Derwent scheme to the extent of one-sixth of Sheffield's share. This scheme is not yet completed. There are still some few (perhaps half-a-dozen) shallow pump and dip wells in the borough, the chemical analysis of the water of which has been unfavourable. Steps are, however, being taken to secure their closure.

Sewerage, sewage disposal, and house drainage.—With the exception of Thorpe Hesley village at the extreme north-west of the borough, in Kimberworth ward, which has a sewerage system and disposal area of its own; of Blackburn village, in that ward, which disposes of its sewage at the Sheffield sewage works close by; and of the hamlets of Dropping Well, Scholes, and part of New Kimberworth, all also in Kimberworth ward, which drain to cesspools, having their overflow to ponds and ditches, Rotherham borough, less one street, is sewered by a high level and by a low level main sewer, which are the means of delivering sewage eventually to an area of 90 acres at Dalton, on the banks of the River Don.

By an agreement made in 1902, Sheffield Corporation arranged to take the sewage of 156 houses in Blackburn, or a daily flow

of 25,740 gallons. There has been no increase in houses since that date.

The unsewered street in Rotherham, above-mentioned, is Steel Street, where 13 generally insanitary houses drain directly to a back-water of the River Don. The low elevation of this street has hitherto been the reason for its remaining unsewered; but the matter of sewerage the street and of pumping the sewage is now engaging the attention of the Corporation. The sewers in the Holme Lane district are not infrequently blocked, and their contents overflow into cellars. They appear inadequate for this largely increased district.

The Thorpe Hesley sewage disposal works may be briefly mentioned here. They consist of settling tanks and coal filters, the effluent passing into an adjacent tributary of the Don. Though at my visit this effluent seemed fairly clear, adverse reports upon its character have been made from time to time by Dr. Maclean Wilson, the Chief Inspector of the West Riding of Yorkshire Rivers Board, who besides reported in June, 1908, that the Don tributary contained sludge in its bed, that the tank effluent was ponding on the surface of one of the filters and escaping unfiltered, and that the arrangements for cleaning out the tanks were defective, causing the filters to be choked up. Since then matters have improved; but I received the impression at my visit that these works required more active supervision. At present the Manager of the Rotherham works is responsible for this supervision; but these works are a considerable distance away and demand much of the Manager's time there.

Since 1898, ten loans for sewerage purposes, amounting in the aggregate to £138,361, have been sanctioned by the Board for varying periods. The largest have been £37,216 for 27 years, in 1898, and £45,775 for 30 years, in 1900. An application to sanction £350 for the extension of an existing sewer is now before the Board.*

Sewage has to be pumped in two parts of the borough by means of Shone's ejectors, and it is siphoned in two places under the River Don.

The attention of the Corporation has been drawn by the Rivers Board to the discharge of crude sewage into the Don from storm overflows, and they are considering how to best obviate this. Probably the inverted siphons, which are apt to become blocked, will be done away with and pumping resorted to.

Sewer ventilation is effected by open road manholes. The number of these on the whole system is not known; but I am informed by the Borough Engineer that there were 148 in 10 miles, 367 yards, under the last sewerage scheme. In all newly sewered streets manholes are now required to be not further apart than 100 yards, with a lamp-eye or ventilating shaft between the manholes. As far as I could observe, the manholes on the older sewers in the borough are much further apart than 100 yards.

Flushing is carried out at the manholes by hosing. Only £25 a year is expended on this. Judging by the condition of the

* Since this was written, the loan has been sanctioned by the Board.

sewers observed by me at some of the inspection chambers, where flow of sewage was sluggish and some deposit was noticed, it is a question whether the present system of flushing should not be supplemented or replaced by some automatic method. This criticism refers more especially to some of the older sewers in the lower parts of the borough where the gradients are flat.

The Rotherham sewage works consist of a subsidence tank and screen, six settling tanks holding 150,000 gallons each, and five filtering beds of coal and clinker, 75 feet in diameter and of an average depth of $4\frac{1}{2}$ feet. Four of these beds are fitted with sprinklers. A large portion of the total 90 acres has been used in the past for broad irrigation of the sewage; but this has been of late abandoned, owing to the clayey nature of the subsoil and to coal subsidences. The effluent from the coal filters now passes along open trenches in different directions, and finally discharges by an 18-inch outlet direct into the River Don. At my visit the effluent as it entered the river was cloudy and showed some suspended matter.

The condition of the Rotherham sewage works engages the active attention of the West Riding Rivers Board, an extract from the fifteenth annual report of which, for the year ending March 31st, 1908, is as follows:—

“The effluents from the sewage works of the Rotherham Corporation are frequently unsatisfactory, and the internal drainage arrangements are as yet incomplete. Some little extension of the sewage works has, however, been carried out during the past year, and arrangements have been made for conveying to the works some of the sewage which has been escaping untreated to the stream. The sewage works as a whole, however, require the consideration of the Corporation, as in their present state they can by no means be considered satisfactory.”

As regards house drainage, some of the most rural portions of Kimberworth ward are entirely destitute of this, slops being thrown direct on to the ground of gardens. Speaking generally of the borough, however, though I saw several blocked and overflowing yard gullies and not a few rainwater pipes that directly entered drains, I cannot regard house drainage as other than on the whole satisfactory, with the above exceptions. In particular, gullies appear to be invariably trapped and sink wastes cut off from direct connection with house drains.

Surface drainage requires attention in several parts, as does the channelling of pavements in the front and rear of houses.

River pollution.—The West Riding Rivers Board obtained an Order of Court in February, 1907, enjoining the Sheffield Corporation to cease to pollute the Don. As a result the Local Government Board has sanctioned a scheme for the reconstruction of the sewage works of that Corporation, which is now proceeding.

Part of the Don pollution is due to the River Rother, which is said to bring polluted matters from Derbyshire to the West Riding.

The Don at Rotherham receives indirectly the sewage of one street, above mentioned.

Excrement disposal.—There are 2,248 privy middens and 8,500 water closets (including troughs) in the borough at present. Usually there are two privies to each ashpit; but sometimes four.

The Rotherham middens are of objectionable type. They are for the most part open, sunk below ground, with unbricked floors; many are of huge dimensions. Some are dilapidated in structure; others leak, whether into streams or into other middens adjoining them, in contiguous streets. A large number of middens are badly placed, viz.: in narrow curtilages, or close to back doors of houses. In some instances sloping slate roofs of privies drip rainwater into the ashpit. I did not find many of the middens over-full of contents at an early period of my inspection; but apparently most of these had been recently scavenged, probably in anticipation of my visit. At a later stage of my inquiry, however, I came across a great many that were very full, and in urgent need of scavenging. This needs to be more frequent and regular. A month is said to be the maximum period for scavenging middens; but I found this official limit was, in practice, often exceeded. Thus, some middens that I saw had not been emptied for three months. In certain cases I was told that middens were scavenged "when required," and that the scavenger was "sent for" when the middens were full. A few (certainly a minority) of the open middens had wet contents at my inspection; but this was made during dry weather for the most part. The open construction of the majority of the middens tends to accentuate in this particular their generally noxious character.

As regards conversion of middens into water closets, this has, since 1892, been carried out in an unsystematic and inequable manner (*see* Appendix I., giving the number converted each year from 1892). And, although the Rotherham Corporation Act of 1904 gives full power to the Town Council to require conversion (*see* section 98 in Appendix II. to this report), full advantage of the Act does not appear to have been taken. Further, no regular systematic conversion has been initiated, since sub-section (2) of section 98, with regard to repayment to owners, has not been acted upon at all. I understand that the cost of converting a midden is about £6, so that the cost to the Town Council would be about £3 in such cases. Notices, too, under sub-section (1) of section 98, are not seldom disregarded: during my inspection, I met with instances where such notices had been served several months before, and nothing had been done. The whole question of privy conversion needs more sustained and concentrated attention at the hands of the Town Council, especially in view of later remarks in this report as to the behaviour of enteric fever in the borough.

Water is laid on almost universally to closets. These are mostly short hoppers with a two-gallon flush. Some are of pedestal pattern. The majority of those that I saw were in distinctly good condition; in a minority of cases there were foul and choked pans. But these were due rather to the carelessness of the people using them than to any inattention on the part of the borough officers.

Refuse disposal.—Where privy middens have been converted into water closets, the ashpit has, in a large number of instances, been retained as a "dry ashpit." Consequently, many of the objectionable features of the old middens have been also re-

tained; their large size has conduced to unduly long retention of refuse, and invited the reception into them of vegetable refuse and garbage. In addition, there are many ashpits distinct from middens; most of these are unroofed and have wet contents. Some, too, are in bad repair. Further, in many instances, there are no ashpits or other receptacle at all, and heaps of refuse are to be seen in back yards, as well as littering of the same over the surface of the yards. Of late, galvanised iron bins have been introduced; there are in all 1,130 of these in the borough. There are also a few wooden tubs.

These bins and tubs are scavenged weekly with fair regularity. The dry ashpits are said to be dealt with every fortnight; but this is not done regularly, since I found accumulations of three and four weeks in some of them.

The contents of middens, ashpits, and bins are removed to the destructor, erected in 1892. This, which is six-celled and top-feeding, is inadequate to deal with the whole of the refuse of the borough, estimated at about 68 tons a day, *plus* 3 tons taken by farmers. The destructor not being able to deal with more than 48 tons a day, a large "tip" has grown up alongside it, consisting of refuse, waiting its turn to be burnt, and of the products of combustion of refuse already dealt with. This "tip" has locally been accused, with some apparent truth, of emitting noxious odours from time to time. A new destructor, containing two three-celled units, is, however, in course of construction, which is estimated to be able to deal with 78 tons of refuse in 16 hours. Power is given, under the Corporation Act of 1904, to expend £15,000 on the purchase of lands and provision of a destructor (section 171, sub-section 4). When this is completed, the "tip" will be done away with.

Another "tip," that at Cankelow, outside the borough, where the "spoil heap" of a coal mine is in constant smouldering combustion, has been said to cause sickness and diarrhœa amongst residents within the borough close to it. It has been vigorously complained of by many of the inhabitants of Rotherham as a nuisance. Since legal steps are about to be taken by the Town Council in the Chancery Division of the High Court, with a view to obtaining an injunction against the colliery company, I refrained from making close inquiry as to the truth or falsity of the above allegations.

Common lodging-houses.—There are eight of these, mostly in West Ward. I visited them all and found serious defects in most of them, *e.g.*, dilapidated ceilings and walls, defective flooring, foul and insufficient latrines and inadequate means of refuse disposal. Very few of the rooms, too, displayed the cards giving the maximum number of occupants and the total cubic space. On the other hand, there did not seem to be any definite overcrowding, and rooms were generally clean.

The question of a municipal lodging-house is now engaging the attention of the Borough Council.

Dairies, cowsheds, and milkshops.—There are 35 cowsheds and dairies, 20 of which are in Kimberworth Ward, the most rural in character of all the wards of the borough. Some were dark and imperfectly ventilated, others dirty and badly paved, and a few overcrowded. But these were in a minority, and the condition of the cowsheds in general may be said to be above the average.

There are 52 registered milkshops, chiefly in the centre of the town. As a rule, milk is sold along with other stores, usually groceries. In some cases, milk is kept in the food larder at these places. The above milk sellers retail one or two gallons a day.

Regulations, after the Board's model, under the Dairies, Cowsheds, and Milkshops Order of 1885, were adopted by the Corporation in 1899. They appear to be satisfactorily carried out.

Slaughter houses.—There are 25 slaughter houses in the borough, in seven of the nine wards. Their condition may, on the whole, be said to be satisfactory, though some are badly paved and inadequately drained. A few are dirty and badly ventilated. But the position of most of them is open to serious objection, since they are, as a rule, situated in central parts of the borough and surrounded by houses. Since the adoption of the Public Health Acts Amendment Act of 1890 by the corporation, licences have to be annually renewed: only some seven new slaughter houses have been licensed since that date.

There is a public abattoir, established in 1899. It is in good condition, well-kept and conveniently situated; but it is not made so much use of by the butchers in the town as might be anticipated. This is probably due to its inadequate size, there being facilities for the slaughtering of only 70 beasts, 100 sheep and 30 pigs every week.

There is some home slaughtering of pigs on unregistered premises.

Bakehouses.—There are seven registered bakehouses. All of these that I saw were in good condition, except that at one of them ventilation might be improved. None are underground.

There are 44 *factories*, 50 *workshops*, and 8 *outworkers'* premises in the borough. Inasmuch as these are under Home Office control, I did not make a regular inspection of them. But in a few factories visited by me where females are exclusively employed, I found distinct lack of efficient ventilation.

Offensive trades.—There are six in the borough, viz.: four tripe boilers and two leather dressers. They are at present unregulated by bye-laws; but they are well supervised and none of them appeared other than satisfactory at my visit.

Pig-styes.—There are 488 of these in the borough, mostly in Kimberworth and Thornhill wards. They need closer super-

vision, especially in the more populous parts of the borough, since I found several that contravened the bye-laws by being within 60 feet of dwellings.

Certain *vital statistics* of the borough are shown in the following Table (B), which gives the birth-rate, general death-rate, infant mortality per 1,000 births, enteric fever death-rate, and diarrhoea death-rate per 1,000 population for the period 1892-1907.

Table (B) showing the Birth-Rate, general Death-Rate, Infant Mortality per 1,000 Births, Enteric Fever Death-Rate, and Diarrhoea Death-Rate per 1,000 Population in the Borough of Rotherham during the 16 years 1892-1907.

Year.					Birth Rate.	General Death Rate.	Infant Mortality per 1,000 births.	Enteric Fever Death Rate.	Diarrhoea Death Rate.
1892	...	...	...	...	35·83	17·86	158	·25	·5
1893	...	...	...	...	37·35	18·91	176	·13	1·65
1894	...	...	...	...	32·21	16·51	157	·28	·15
1895	...	...	...	...	36·19	16·67	154	·23	1·19
1896	...	...	...	...	34·36	15·02	149	·22	·56
1897	...	...	...	...	34·62	18·13	178	·37	·76
1898	...	...	...	...	34·33	16·75	161	·23	1·29
1899	...	...	...	...	35·91	17·62	169	·36	1·09
1900	...	...	...	...	36·21	18·31	171	·15	·91
1901	...	...	...	...	35·27	17·64	176	·14	2·12
1902	...	...	...	...	34·56	15·17	141	·16	·58
1903	...	...	...	...	33·34	17·31	188	·17	1·58
1904	...	...	...	...	32·71	16·61	164	·20	1·49
1905	...	...	...	...	31·91	14·25	123	·03	·42
1906	...	...	...	...	31·56	17·25	158	·13	·83
1907	...	...	...	...	32·27	16·44	147	·10	·37
Averages of 1892-1907					34·17	16·86	161	·19	·97
Corresponding rates or 1907 in the Registrar-General's 76 "Great Towns."					27·0	15·4	127	·07	·40

N.B.—These rates are calculated on the estimated population of each year given in Table vi. of the Medical Officer of Health's Annual Report for 1907.

The averages of these rates have been calculated and compared with that of the 76 "great towns" for 1907, no comparison for

the whole period being possible. It will be seen that the average Rotherham rates are, in each and every instance, higher than that of the 1907 rate for the "great towns." Especially, the enteric fever and diarrhoea death-rates are more than double as high.

Coming now to the prevalence of enteric fever and mortality therefrom in the borough, Table (C) shows, for 1892-07, the number of enteric cases notified and dying in each year, with the case-incidence and death-rate per 1,000 of population, and the mortality per cent. of cases. Averages of the whole period are also appended.

Table (C) showing for each of the sixteen years 1892 to 1907 the Number of Notifications of Enteric Fever and of the Deaths therefrom, with the Case-incidence and Death-Rate per 1,000 of Population, and the Mortality per cent. of cases.

Year.	Estimated Popula- tion.*	No. of Cases notified.	No. of Deaths.	Case- incidence per 1,000.	Death- rate per 1,000.	Case- mortality per 100.
1892	44,000	43	11	1.0	.25	25.6
1893	46,000	65	6	1.4	.13	9.2
1894	47,000	53	13	1.1	.28	24.5
1895	48,000	79	11	1.6	.23	13.9
1896	50,000	82	11	1.6	.22	13.4
1897	51,000	91	19	1.8	.37	20.9
1898	52,000	60	12	1.2	.23	20.0
1899	53,000	101	19	1.9	.36	18.8
1900	54,000	72	8	1.3	.15	11.1
1901	56,000	77	8	1.4	.14	10.4
1902	57,000	58	9	1.0	.16	15.5
1903	58,000	67	10	1.2	.17	14.9
1904	59,000	42	12	.7	.20	28.6
1905	60,000	56	2	.9	.03	3.6
1906	61,500	66	8	1.1	.13	12.1
1907	62,500	47	6	.8	.10	12.8
Averages of 16 years, 1892-1907 ... }	54,938	66	10.5	1.2	.19	15.9

* These are the estimates furnished by the Medical Officer of Health—see Table vi, in his Annual Report for 1907.

It will be seen that the average case-incidence was exceeded in seven years of the period examined; but has not been so exceeded since the year 1901. The death-rate has exceeded the average eight times in the period; but only once since 1899, viz., in 1904. These facts point to some lessening both in the prevalence and the mortality from enteric fever in Rotherham of late years. Case-mortality per cent., or fatality, has been very variable during this period; on seven occasions it has been above the average, but not since 1904. In this year, fatality was very high (28·6); but was succeeded the next year by a very low rate (3·6).

During 1908 there have been 99 notifications and 16 deaths, giving, up to January 1st, 1909, a case-incidence of 1·5 on an estimated population of 64,000; a provisional death-rate of ·25 per 1,000; and a provisional case-mortality of 16·2 per 100. These rates are all above the average of those of the whole period; the case-incidence and death-rate are higher than in any year since 1899. Apparently, there has been some re-crudescence both of prevalence and mortality in 1908.

The next Table (D) gives for the 2 $\frac{3}{4}$ years, 1906, 1907, and 1908 (to September 30th) the notifications and deaths in each month of the year:—

Table (D) showing for 1906, 1907 and 1908 (to 30th September), the number of notifications of Enteric Fever and of the deaths therefrom in each month.

Month,	1906.		1907.		1908 (to 30th September).		1906-08 (to 30th September).	
	Notifications.	Deaths.	Notifications.	Deaths.	Notifications.	Deaths.	Notifications.	Deaths.
January	4	1	6	2	9	1	19	4
February	3	1	3	—	5	—	11	1
March	4	—	3	1	4	—	11	1
April	3	—	2	—	16	3	21	3
May	1	1	—	—	8	1	9	2
June	5	—	1	—	7	1	13	1
July	5	—	2	—	8	—	15	—
August	8	2	5	—	5	1	18	3
September	8	2	4	—	12	2	24	4
October	10	—	10	1				
November	9	1	7	1				
December	6	—	4	1				
Whole year ...	66	8	47	6	74	9		

This shows a fairly equable distribution of cases and deaths through each of the years examined, though there is a slight

excess in the third quarter. The abnormal number of notifications in April, 1908, was due to a localised outbreak of enteric fever in that month.

Table (E) exhibits a further analysis of the 187 notifications and 23 deaths occurring in the same period of $2\frac{3}{4}$ years, by distributing them in the wards of the borough:—

Table (E) showing for each Ward of the Borough the Number of Notifications of Enteric Fever and of the Deaths therefrom during 1906, 1907, and 1908 (to 30th September), with the Average yearly Number and Rate per 1,000 in each Ward.

Ward.	1906.		1907.		1908. (to Sep- tember 30.)		Total.		Average Yearly Number of		Average Yearly Rate per 1,000 of Estimated Population (1908).	
	Notifications.	Deaths.	Notifications.	Deaths.	Notifications.	Deaths.	Notifications.	Deaths.	Notifications.	Deaths.	Notifications.	Deaths.
East ...	1	—	5	—	3	2	9	2	3·3	·7	·60	·13
St. Ann's ...	6	—	5	1	3	1	14	2	5·1	·7	·68	·09
Clifton ...	2	—	2	—	3	1	7	1	2·5	·4	·44	·07
South ...	6	2	6	1	4	—	16	3	5·8	1·1	·86	·16
West ...	5	1	6	1	16	4	27	6	9·8	2·2	1·83	·41
North ...	17	2	6	—	13	1	36	3	13·1	1·1	1·57	·13
Thornhill ...	10	1	10	2	10	—	30	3	10·9	1·1	1·30	·13
Masborough...	13	1	4	—	5	—	22	1	8·0	·4	·93	·05
Kimberworth	6	1	3	1	17	—	26	2	9·5	·7	1·19	·09
Whole Borough	66	8	47	6	74	9	187	23	68·0	8·4	1·06	·13

It will be gathered from this table that North and Thornhill Wards gave the highest yearly average of notifications in this period, and West Ward the highest yearly average of deaths. But, on taking these averages as rates per 1,000 of the 1908 estimated population given in the former Table (A), it is seen that the maximum rate, both of notifications and deaths, was in West Ward.* Now, on reference to Table (A), it is seen that West Ward has the lowest density but one of all the wards of the borough, and the lowest of all the purely urban wards. It is, therefore, evident that enteric fever in Rotherham, during the period examined, was not correlated with density of population.

Table (F), which follows, exhibits the age and sex-incidence of attack and mortality of these 187 cases, expressed as a proportion per 1,000 of the total population at certain age-groups at the 1901 Census:—

* Part of the excess in West Ward is due to the position of the workhouse in it. From this institution seven cases were notified in 1906-8, of which three came from outside the borough and four from common lodging houses in the borough, probably also contracted outside.

Table (F), showing the Age-incidence and Sex-incidence of attack and of Mortality of 187 cases of Enteric Fever notified in 1906-1908 (to 30th September) in proportion to the Total Population at certain Age-groups at the 1901 Census.

Age-period.	Number of males in the Borough at the 1901 Census.	Number of males notified with Enteric Fever in 1906-08.	Number of males died of Enteric Fever in 1906-08.	Male case - incidence per 1,000.	Male mortality - incidence per 1,000.	Number of females in the Borough at the 1901 Census.	Number of females notified with Enteric Fever in 1906-08.	Number of females died of Enteric Fever in 1906-08.	Female case - incidence per 1,000.	Female mortality-incidence per 1,000.	Number of both sexes in the Borough at the 1901 Census.	Total number of notifications of Enteric Fever in 1906-08.	Total number of deaths from Enteric Fever in 1906-08.	Total case - incidence per 1,000.	Total mortality - incidence per 1,000.
0-5	3,696	14	1	3.8	3.3	3,856	11	1	2.9	.3	7,552	25	2	3.3	.3
5-10	3,317	22	2	6.6	.6	3,194	16	—	5.0	—	6,511	38	2	5.8	.3
10-15	2,765	14	2	5.1	.7	2,850	10	1	3.5	.4	5,615	24	3	4.3	.5
15-20	2,700	11	—	4.1	—	2,556	9	—	3.5	—	5,256	20	—	3.8	—
20-25	2,826	9	1	3.2	.4	2,541	8	1	3.1	.4	5,367	17	2	3.2	.4
25-30	2,619	10	—	3.8	—	2,316	9	3	3.9	1.3	4,935	19	3	3.8	.6
30-35	2,120	13	4	6.1	1.9	1,852	6	—	3.2	—	3,972	19	4	4.8	1.0
35-40	1,717	7	2	4.1	1.2	1,600	6	—	3.8	—	3,317	13	2	3.9	.6
Over 40	6,138	8	2	1.3	.3	5,686	4	3	.7	.5	11,824	12	5	1.0	.4
All ages	27,898	108	14	3.9	.5	26,451	79	9	3.0	.3	54,349	187	23	3.4	.4

From this table it is seen that the case-incidence on males was greater than that on females. The male mortality incidence was also a little higher than the female mortality incidence. Both in males and females the age-period, 5 to 10 years showed the maximum case-incidence. But the period 30 to 35 years was most fatal for males, being greater in them than in both sexes; whilst 25 to 30 years was the most fatal for females, being double that in both sexes.

It is noteworthy that the age-period usually found to be the most susceptible to attack by enteric fever, viz., 15 to 25 years, showed, for these 187 Rotherham cases, a male case-incidence of only 7·3, a female case-incidence of only 6·6, and for the two sexes, 7·0 per 1,000; whilst the mortality-incidence was equally low for both sexes (0·4 per 1,000) in this decennium of life. So marked a case-incidence in both sexes on the period 5 to 10 years, as shown in the above Table (F), is unusual for enteric fever, and, *primâ facie*, though the numbers are too small for very precise deduction, suggests school-influence. It is significant that 36 of the total 38 in this age-period (5 to 10 years) were actually school-children; and that, further, of the total 187 notifications during the period examined, no less than 51 were attending one or another school in the borough at the time of their attack by enteric fever (a percentage of 27). It became necessary, therefore, to inquire a little more closely into this matter. With this view, I visited the 15 schools in the borough which these 51 children attended. At only two of these 15 schools was the number of children attacked markedly above the average, viz., at Thornhill Council School, where 11 attacked children attended, and Talbot Lane Council School where 7 such children attended, during the 2½ years examined, a yearly average of 4 and 2·5, respectively.

The number on the rolls at Thornhill school is 1,420, and the average attendance 1,299; at Talbot Lane, the figures are 273 and 241. It cannot be said, therefore, that there was any abnormal incidence on these or any schools in Rotherham. As to their general sanitary condition, though some of the other schools showed defective through ventilation, overcrowding could be said to exist in only two of them; and only one disposed of excrement in a midden, which, however, was foul and leaky. Altogether, I gathered the impression that most of the defects in these particular schools were of more or less minor character; and not of sufficient importance to have determined the incidence of enteric fever in the children attending them. Amongst such defects were damp walls, dirty floors, dark and badly-situated trough closets, and inadequate cloak rooms. But as regards fever incidence, it happened that the most defective schools had the fewest cases, and *vice versâ*. Thus, the two schools mentioned above as having afforded the most cases of fever in 1906-8, were distinctly above the average of the whole in respect of general sanitariness. So that one is justified in excluding local school conditions as having had any share in causing or spreading enteric fever in Rotherham. These schools which I examined and the other public elementary schools of the boroughs, are under the Education Committee of the Corpora-

tion, who have engaged the services of Mr. Hey as "Director of Education." Both the Committee and Mr. Hey are fully alive to the necessity of prompt dealing with sanitary defects in these schools.

It should be mentioned that, from personal questioning and from information given to me by the medical officer of health, there seems some doubt as to whether all the children, aged 5 to 10 years, certified as enteric fever cases, were in reality suffering from that disease. In this connection, it is noteworthy that 45 of the total 99 notifications in 1908 were in the practice of one firm of medical men. Though having some reason to doubt the genuineness of the diagnosis in many of these cases, the medical officer of health has, of course, accepted the notifications, and acted as if there were no doubt about their being cases of enteric fever.

It is seen, from Table (C) above, that enteric fever is endemic in Rotherham. Though there are signs of some lessened prevalence and mortality in more recent, as compared with antecedent years, there has been recrudescence of both in 1908. In discussing the causes of this endemicity, or the conditions associated with it, by the light of investigation of the 187 cases notified in 1906-8, water can be definitely excluded. There has been no explosive exacerbation of the fever likely to suggest water as a competent cause. It must be remembered, too, that of the various supplies, accused in 1891 of causing enteric fever, a part only of one such supply, viz., Pinch Mill spring, part of the high-level supply of 1891, now remains, all the others having been one by one abandoned. It is true that the water of this spring is open to some suspicion, as before related; and it is significant that it supplements occasionally Langsett water in the central parts of the borough, where enteric fever has prevailed to considerable extent. But, on the other hand, the immunity from enteric fever of the constant area of supply of this water, viz., Thorpe Hesley and Scholes villages and isolated portions of Kimberworth Ward, goes largely to exculpate the Pinch Mill spring source.* This water, however, requires careful watching, and chemical should be supplemented by frequent bacteriological analyses, since such waters as Pinch Mill spring, which contain nitrates, are known to be favourable to the growth of the *bacillus typhosus*.

Similarly, milk can be eliminated; the purveyors of milk to those attacked were many and various, and no milk dealer's customers were disproportionately attacked.

I made inquiry also into other articles of food, such as shell-fish, fried fish, watercress, and celery; but with altogether negative result.

Contrary to what I had at first expected, I found that personal infection had taken very little part, comparatively, in the dissemination of the fever in the years examined. It is true that there were a few localised outbreaks, such as that in Wilfrid

* Dr. Weatherbe, Medical Officer of Health to the Rotherham Rural District, informs me that he has not been able to trace infection in any case of enteric fever at Whiston to the Pinch Mill spring water; but that he has for some time regarded this water with suspicion.

Street in April to June, 1908, which was made the subject of a special report to the Board by the medical officer of health, in which infection was probably started by an unrecognised case and propagated from person to person in closely contiguous houses; and another, in which dropping cases occurred in a family, home-treated and home-nursed, in Deepdale Road, between January and April of the same year. And there was one instance in which infection appeared to have been started by a recently discharged hospital patient, who had been only 27 days in hospital. This was the nearest suggestion to a "carrier" case that I met with, though I came across other seemingly premature discharges from hospital, *e.g.*, after 18 days' stay,* to which, however, no infection could be traced. Such instances of personal infection were, however, distinctly rare; and I came across very few instances of multiple cases in families which could be explained on a thesis of personal infection. Rather, were some such multiple cases referable to a common cause outside the family. The consideration that the most enteric fever in 1906-8 took place in the least dense ward of the urban part of the borough is also against this view of its spread. And this is supported by the fact that the 187 notifications during the above period were from 159 different houses in 101 different streets.

The result of my investigation into the circumstances of these notifications emphasised the factor of *recurrence*. Thus, there was, in order of relative frequency:—

- (a) recurrence in the same streets in successive years;
- (b) recurrence in the same streets in the same year;
- (c) recurrence in the same houses in successive years.

Numerous examples of the above, especially of (a), could be given. Indeed, 26 of the total 101 streets above mentioned contributed cases of fever in two of the three years examined, and 4 of them contributed cases in all the three years.†

To what causes or factors is this *localised recurrence*,‡ therefore, due? First of all, the question of the relative incidence of the disease on persons using middens and persons using water closets deserves examination. Now, in 1906-8, 48 of the persons notified used middens, and 139, water closets, so that the proportion of the two classes was as 1 : 2·9. But there are 2,248 middens and 8,500 water closets in Rotherham, or a proportion of 1 : 3·8. Therefore, assuming that each midden and each water closet is used on an average by the same number of people,

* The average duration of stay of recovered cases of enteric fever was, in 1906, 32 days, in 1907, 30 days, and in 1908, 37 days. In the Metropolitan Asylums Board hospitals the average duration of stay of recovered cases in 1907 was 59·4 days (*see* Annual Report for that year).

† It is noteworthy, as bearing on the relation of diarrhoea to enteric fever, that in the first three quarters of 1908 41 deaths from diarrhoea (mostly infantile) occurred in 33 streets, in 14 of which there also occurred cases of enteric fever during that period.

‡ In an appendix to Mr. Lee's 1850 report, before mentioned on pp. 2 and 3, he gives a section of a "fever locality" shewing "percolation of filth through subsoil."

the incidence of enteric fever was, in 1906-8, $\frac{48}{2,248}$, or 21·3 per 1,000 middens, and $\frac{139}{8,500}$, or 16·3 per 1,000 water closets, an excess of 5 per 1,000 on middens. This difference, though not great, is in the direction which one might have expected, in view of the faulty conditions above noted with respect to Rotherham middens.

But improper excrement disposal does not appear to be the only local factor concerned in determining the recurrence, year after year, of enteric fever in the same localities at Rotherham. Defective refuse disposal, inadequate scavenging, insanitary condition of back yards, and ineffective restraint of animal keeping therein, as well as badly ventilated houses, are probably contributory causes; whilst the incomplete disinfection of patients' belongings (*see* p. 25 later) and the undue number of cases treated at home (*see* p. 24 later), with consequent risk of fouling middens and surface soil by patients' discharges, no doubt assist these local influences. The whole of these maleficent conditions combine together to afford ready opportunity for the perpetuation of the enteric fever organism.*

Referring now to sanitary administration in the borough, there are 9 aldermen and 27 councillors, 3 for each ward. The Public Health Committee is composed of all the members of the corporation. Like the borough council, it meets every month.

Mr. W. J. Board, Solicitor, is Town Clerk, at a salary of £950, having been appointed in 1904. He has had considerable experience of municipal public health work, having been trained in the offices of the Cardiff Corporation.

Alfred Robinson, M.D. (Durham University), M.R.C.S., L.S.A., Licentiate in Sanitary Science (Durham University), is medical officer of health. Appointed a part-time officer in 1892 at £100, increased in 1900 to £150, he became a full-time officer in 1906, and is now receiving £400 a year for his services, half charged to the Exchequer contribution account. In addition, Dr. Robinson receives £50 for superintending the isolation hospital, £25 as police surgeon, £25 as medical officer to the Education Committee, and £200 for the medical inspection of school children. He has been resident in Rotherham for some twenty years; and is, therefore, well acquainted with its local conditions, having first acted as a general practitioner before he became medical officer of health. Dr. Robinson is a thoroughly competent officer; he has made useful annual and special reports to the Borough Council, though his advice, contained therein as well as in his usual monthly reports to the public health committee, has not always been followed by the borough council. He personally undertakes bacteriological examinations, both at the isolation hospital, and at his laboratory at the municipal

* The carriage of enteric fever by house-flies has been suggested by the medical officer of health; but at present there are no definite data on this matter, and I had no opportunity during my inspection (which was at a cold season of the year) to make any personal observations on the subject.

offices. He subjects the blood-serum of enteric fever patients at the hospital to examination for the Widal reaction; and at the municipal laboratory he examines a great many throat swabs, including some sent by private medical men. It will be shown later in this report how Dr. Robinson's services could be rendered still more valuable for the Corporation.

The inspectors of nuisances are:—

- | | |
|---|-------------------------------|
| (1) <i>Mr. C. E. Parkin</i> (senior), who ranks as chief inspector; | |
| (2) <i>Mr. C. E. Parkin</i> (junior) | } who rank as sub-inspectors. |
| (3) <i>Mr. W. Pearce</i> | |

Mr. C. E. Parkin (Senr.) was appointed in 1873 at £150, having previously been for two years in the same position under the Sheffield Corporation; previous to that he was in the building trade. He now receives a salary of £250 (including £15 as inspector under the Contagious Diseases (Animals) Act, and £6 as inspector of canal boats), half repaid from the Exchequer contribution account. Though holding no certificate, he is an old and experienced officer, and his work has been favourably commented upon by certain of the Board's inspectors from time to time. I have, however, criticism to pass upon this officer's present work, in two chief respects, viz.:—(1) the keeping of the "nuisance record book"; and (2) the superintendence of the scavenging arrangements. There were many blanks in the above book, which failed to give any information, in numerous cases, as to what action had been taken with regard to nuisances. This leads me to suppose that many of the notices of abatement that had been served had not been carried out, which agrees with what I found, in several instances, on my inspection of the borough. I refer especially to the important matters of privy conversion and substitution of pails for foul ashpits. No prosecutions for non-abatement of such and similar nuisances have taken place for many years past. *Mr. Parkin*, indeed, is altogether too tender and lenient towards property owners, especially when they happen to be borough councillors or aldermen. Many notices served upon such persons have remained unacted upon for many months. Again, though 54 men and 8 horses and carts (one for each of 8 sections of the borough) are employed in scavenging, the results that I found, during the inspection, show that this is not carried out as regularly, thoroughly, and equably as it might be, and is intended to be. Thus, middens are supposed to be emptied once a month at least, dry ashpits cleansed every week, and pails removed every week. But numerous instances were found, during my inquiry, where these limits had been largely exceeded. The inadequacy of the present destructor may partly explain these defects in scavenging, but not wholly, my observations leading me to conclude that closer and better supervision is required. In other respects, *Mr. Parkin's* work is apparently well performed, and his other books are well and carefully kept. He reports, directly and independently of the medical officer of health, to the public health committee. Though close on 70 years, he appears healthy and active.

Mr. C. E. Parkin (Junnr.), who is the son of the above-mentioned officer, was appointed in 1892 at £150.

Mr. W. Pearce was appointed in 1907 at £90. The salaries of neither is repayable. Each officer has the certificate of the Royal Sanitary Institute: *Mr. Pearce* has also the "meat certificate" of that body. Both officers appear to have a good knowledge of their duties, and to perform them in a satisfactory manner.

I now have to comment upon the fact that *Dr. Robinson*, though in name the head of the sanitary department of the borough, is in reality not so, since he divides his jurisdiction with *Mr. Parkin*, senior. Rightly or wrongly, *Mr. Parkin* ranks as an independent officer, though he is regarded by the borough council as being under the Board's Order of 23rd March, 1891.* To support this view, the Corporation apparently rely upon the italicised portion of the following quotation from Article 19 (1) of the Board's Order relating to the duties of inspectors of nuisances, viz.:—"He shall perform, either under the special directions of the sanitary authority, or (*so far as authorised by the sanitary authority*) under the directions of the medical officer of health . . . all the duties, . . . &c." *Mr. Parkin* having served the Corporation for 35 years, and *Dr. Robinson* having been a whole-time officer for less than three years, it is, perhaps, natural that the Corporation should hesitate to make the one subordinate to the other. This attitude is extended to the relations of *Dr. Robinson* with the other two inspectors, who are regarded as sub-inspectors, and solely under *Mr. Parkin*, and as having courtesy relations only with *Dr. Robinson*. So far are these conceptions carried, that *Mr. Parkin* regards himself as solely responsible for the keeping of the books of these subordinates, and, as regards his own books, as well as theirs, interprets Article 19 (12) of the Board's Order, which runs thus: "He shall at all reasonable times, when applied to by the medical officer of health, *produce to him* his books or any of them" to mean, that the medical officer of health is at liberty to *inspect* them whenever he likes at his (*Mr. Parkin's*) office. The consequence of this has been that *Dr. Robinson* never sees *Mr. Parkin's* books or those of the sub-inspectors; nor are these produced to the public health committee or council, or seen by the town clerk. *Dr. Robinson*, too, never sees, much less approves or initials, the statutory notices of nuisance abatement. Indeed, he has little or no voice in this important matter, nor in those of scavenging and disinfection. *Mr. Parkin's* work is thus, to a large extent, uncontrolled, owing in great measure to the fact that he has enjoyed the confidence of the Corporation for so long a time. The above state of things (into which, however, to the credit of both officers concerned, there enters no trace of personal bitterness) is not conducive to the best sanitary administration of an important borough like Rotherham. I am strongly of opinion that, at a convenient opportunity, this duality of jurisdiction should cease; and that

* On consulting the Boards records, I find that, though *Mr. Parkin's* appointment was periodically confirmed by the Board up to November 1904, in October 1903, after Rotherham had become a County Borough, *Mr. Parkin* was appointed a permanent officer. To this arrangement the Board's sanction does not seem to have been given.

the medical officer of health should be, *de facto* as well as *de jure*, the single head of the sanitary department of the borough.

Mrs. Kemp is health visitor, having been appointed in 1906, at a salary of £90 a year. She holds the certificates of the Royal Sanitary Institute and of the Sanitary Inspectors' Examination Board, and of the Central Midwives' Board. For four years previous to 1906, *Mrs. Kemp* was a sanitary inspector under the Corporation of Sheffield. She acts under the direction of the medical officer of health, and reports to the public health committee through him. In the matter of uncleanness of and overcrowding in houses, she serves statutory notices, under the supervision of Dr. Robinson, and thus acts, in this sense, as a sanitary inspector. The midwives and district maternity nurses of the borough are under her control. She gives sound advice to mothers on feeding, and takes an active part in supplying them, at cost price, with dried powdered milk, and in weighing babies from time to time. Various pamphlets, some drawn up by Dr. Robinson, relating to feeding and rearing, and care of the eyes of infants; causation of diarrhœa, prevention of puerperal fever and of consumption, unprotected fires, &c., are left by her at houses during her visits. I found *Mrs. Kemp's* books well kept, and regard her as a thoroughly efficient and most useful officer of the corporation. There is a voluntary association of lady workers in Rotherham, who appear on the scene after *Mrs. Kemp's* visits, and endeavour to emphasise her advice. She is also in close *rapport* with the midwives of the borough, through the machinery of early notification of births, and is thus enabled to visit newly-born children at the earliest possible moment. So useful has this collaboration been, that Dr. Robinson has shown that, whilst the infant mortality of the whole borough was in 1907 146 per 1,000 births, that of 997 infants, whose mothers were attended by the borough midwives, was only 107, compared with a mortality-rate of 185 amongst 1,020 infants, whose mothers were not so attended.† Since some 50 per cent of the births in Rotherham are attended by midwives, it follows that the above arrangement entails a vast amount of work upon the single health visitor. There is little hand-feeding* or employment of female‡ labour in Rotherham; but considerable alcoholic intemperance, as well as addiction to gambling and betting, in both sexes.

As bearing on the relation of the work of the health visitor and midwives to infant mortality, it is significant that whereas this averaged 162 for the ten years previous to 1906, in this year it was 158; in 1907, 147; and in 1908 (to December 25th) 141 per 1,000 births registered.

Prizes have been offered by the Mayoress of 1906 to midwives

* The proportion of breast-fed to bottle-fed children is 11:1. But in 1907, the percentage mortality of bottle-fed children, whose mothers were attended by midwives, was 62, compared with 2 amongst breast-fed children so attended.

† Less than 5 per cent of the women are so engaged.

‡ The contrast for 1908 is even greater, viz, rate for whole Borough 149, rate amongst midwives' cases 92, rate for other agencies 195.

having the largest percentage of mothers and children living of the confinements attended within a certain period. The same lady (Mrs. Stoddart) has provided a fund for supplying food to poor parturient women. Dr. Robinson, in his annual reports for 1907 and 1908, refers with approval to the utility of the Midwives Act, 1902, as a public health measure. He refers therein not only to the useful rôle that this Act fulfils in repressing infant mortality, through the collaboration of the midwives with the health visitor and the voluntary workers (as above shown); but also refers to the lowering of child-bed mortality by the operation of the Act. Thus, whilst in England and Wales this was in 1907 one in every 231 labours, in Rotherham it was one in 331. There are 16 certified midwives in the borough. In 1907 four midwives and in 1908 one were struck off the roll for malpractice and negligence.

The notification certificates of infectious diseases are received by the medical officer of health, who stamps them, passes them on to the inspector of nuisances for record, and files them, when returned by the latter. The particulars of the notifications are entered in a register kept by the Inspector of Nuisances, who makes at once a preliminary investigation, and adds certain further data to the register, such as: Occupation, school, description of house, number of occupants, "sanitary arrangements" (meaning, usually, excrement disposal), water, and milk supply.

The medical officer of health says that he personally inquires into three-fourths of the certified cases, either at the hospital or the home of the patient. There is, however, a tendency, in many instances, to confine inquiry as to causation to the inspector's preliminary visit, and not to supplement this by close investigation by the medical officer of health subsequent to the inspector's visit. No details as to history of infection are entered in the register of notifications, and no information is given as to "missed" or "carrier" cases in this register. Written instructions are left with householders as to dealing with home-treated cases of scarlet fever, diphtheria, and enteric fever; but it has been found impossible to quarantine the mother when acting as nurse to her family. In fact, there can be very little control over such home-treated cases of infectious disease; and any attempt to exercise it is usually resented by the attending practitioner.

Hospital removal is urged to a large extent; though this might be effected to a greater degree in the case of enteric fever. But the hospital removals of this disease are increasing, owing to the popularity of the newly-established hospital. Thus, whereas in 1906 only 14 out of 66 notifications of this disease were removed to hospital, in 1907 there were 20 out of 47, and in 1908, 49 out of 99. All the enteric fever admissions to hospitals are subjected there to the Widal agglutination test; about 50 per cent. were positive in 1906 and 1907, and 66 per cent. in 1908.*

*Professor Dreyer of Oxford, referring to his Copenhagen experience in 1906 and 1907, states that 99·1 per cent of the cases of undoubted clinical typhoid fever gave a positive reaction, and 98·77 per cent of the cases which proved not to be typhoid gave a negative reaction. See, in *Journal of Pathology and Bacteriology*, vol. xiii (1909), "Widal's reaction with sterilised cultures," by Professor Dreyer.

Medical practitioners are invited to submit blood-serum of their patients for similar examination; but few avail themselves of the offer.

As regards ambulance arrangements, the ambulance is kept at the hospital; horses are supplied from the fire brigade station. In spite of the distance between these places, removal is said to be effected invariably on the day of notification, generally within a few hours. After office hours and on Sundays, communication is made to the medical officer of health, who arranges for the despatch of the ambulance. This is always disinfected at the hospital after use.

Neither the medical officer of health nor the inspector of nuisances has building plans referred to him. These appear to be exclusively dealt with in the Borough Engineer's office.

Hospitals for infectious diseases.—A loan was sanctioned by the Board in 1902 for £2,200, repayable in 60 years, for a hospital site; and in 1903 for £21,000, repayable in 28 years, for hospital buildings. The site, in Badsley Moor Lane, a little over a mile from the centre of the borough, comprises about $8\frac{1}{2}$ acres, of which 5 acres are used at present. There is a high boundary wall along Badsley Moor Lane; and on the other side of the site an unclimbable 6-foot 6-inch galvanised-iron fence. The buildings were completed and the hospital opened early in 1906. The scheme comprised two scarlet-fever pavilions, one for acute cases, of 18 beds, another for mild or convalescent cases, of 16 beds; an enteric-fever pavilion, of 14 beds; a diphtheria pavilion, of 14 beds; and an observation block, of 4 beds; in all, 66 beds. Of these, all but the mild or convalescent scarlet-fever pavilion have been erected; room is left for this on the site. An administration block, with 15 bedrooms on the first floor; laundry and discharge blocks, mortuary, ambulance shed, and porter's lodge complete the equipment of the hospital. I was favourably impressed with the whole institution, which appears to have been well and substantially built, and in accordance with the plans submitted to the Board. The laundry is well arranged and ordered; there is in this block a Washington Lyon's steam disinfector. This serves for the town as well as the hospital clothing. An ambulance is kept in a shed near the mortuary.

Before the loan for the above site was sanctioned, an undertaking was given by the borough council to the Board that cases of small-pox should not be isolated upon it; and that, as soon as the hospital was erected on the site, cases of small-pox should not be treated in any building within a quarter of a mile of the site. There is, as a matter of fact, an altogether unsatisfactory temporary small-pox hospital within 150 yards of the present fever hospital, on the old (disused) wooden fever hospital site. In pursuance of their undertaking, the borough council have definitely abandoned the use of this small-pox hospital; and have acquired a site of some 9 acres near Kimberworth, at a cost of £1,298, under the powers of section 171, sub-section 5, of their Act of 1904, and with the sanction of the Board. Instructions have been given to the Borough Surveyor to prepare plans and estimates for a building for the reception of small-pox on this

site; application will shortly be made to the Board to sanction a loan for this purpose.

Disinfection.—Sulphur fumigation is the usual method employed. It is replaced in a few instances by the use of formalin; but this agent has only been employed seven times since March, 1907. Occasionally walls are sprayed with formalin or bichloride of mercury; but woodwork is not, as a rule, washed down, nor walls stripped. Gullies and middens are sprinkled with disinfectant powders or liquids. Clothing and bedding are taken to the hospital to be put through the disinfector in about one-half the cases of enteric fever, viz., where such articles are soiled by discharges; but not at all in scarlet fever or diphtheria. Clothing is occasionally burnt, as in small-pox. A reason given for the failure to disinfect more enteric-fever clothing and bedding is the distance of the apparatus from the town. But I can hardly regard this as a satisfactory excuse for neglecting to deal with such articles in all cases of enteric fever, and in those of scarlet fever and diphtheria; since the hospital, where the disinfector is kept, is little over a mile distant. To my mind, the disinfection methods employed at Rotherham are at present inadequate and incomplete; they require considerable improvement. The chief inspector of nuisances undertakes the responsibility of carrying them out; apparently, the medical officer of health has little or no voice in the matter.

The most recent local Act in force is the Rotherham Corporation Act of 1904, which adds to the powers already conferred by various local Acts, from 1863 onwards.

The following Acts have been adopted by the Borough Council:—

Public Libraries Act.

Infectious Diseases (Prevention) Act, 1890.

Public Health Acts (Amendment) Act, 1890 (parts ii. and iii.).

Part iii. of the Housing of the Working Classes Act, 1890.

Notification of Births Act, 1907.

Voluntary* notification of phthisis has been in force since April, 1906. In 1906 64 cases were notified; in 1907, 98; and in 1908, 90.

The following bye-laws are in force:—

	Confirmed in
Pleasure grounds	1893
Nuisances and cleansing of footways and pavements	"
Slaughter houses	"
Common lodging houses	"
New streets and buildings	"
Danger from whirligigs and swings, &c. ...	"
Omnibuses	"
Hackney carriages	"

* This was written before the Board's Order prescribing compulsory notification of pauper cases of phthisis was issued.

	Confirmed in
Locomotives on highway	1901
Paving of yards and open spaces	1902
Houses let in lodgings	1903
Tramways	1904
New buildings (height of rooms)	1906
Good rule and government of the borough ...	1907
Employment of children	1908

In concluding this report, I wish to express my thanks to those aldermen, councillors, and officials of the corporation who rendered me assistance during my inspection; as well as to certain of the medical practitioners in the borough who afforded me information with regard to certain points in connection therewith. I also acknowledge the useful help of the West Riding County Medical Officer.

R. DEANE SWEETING.

Recommendations.

The following appear to be the chief sanitary requirements of the borough:—

(1) More attention should be paid to insanitary, especially back-to-back, house property: the powers of the Housing of the Working Classes Act, 1890, should be more freely exercised with respect to such property. Overcrowding in houses should be carefully watched. The paving of back yards requires considerable improvement: the bye-laws with respect to them should be stringently enforced. All tenement houses should be registered, and the bye-laws with respect to them put in force. The keeping of animals in back yards should be more rigorously repressed, wherever there is reason to believe that they will cause nuisance.

(2) The Ulley water should not be resumed as a source of supply to the borough until the drainage of Morthen, Brampton, and Ulley has been greatly improved. The Pinch Mill spring water should be carefully watched and frequent bacteriological, as well as chemical, analyses of it should be made. In case of shortage of water in the borough, before the Derwent scheme is completed, arrangement should be made with Sheffield corporation for a greater supply from Langsett reservoir.

(3) The sewerage of Dropping Well, Scholes, New Kimberworth, and Steel Street should engage the attention of the corporation. Closer attention should be paid to the Thorpe Hesley and Rotherham sewage works. The ventilation of the older sewers in the borough should be improved. Flushing of sewers, as at present carried out, should be replaced by some other method, e.g., automatic or regulative. All rainwater pipes should be cut off from direct communication with house drains.

(4) The conversion of midden-prives into waterclosets should be carried out more actively, regularly, and stringently: the powers of the Corporation Act of 1904 should be made use of, especially as to repayments to owners: with a view to lessen the cost to the corporation of such repayments, application should be made to the Board to put in force sections 39 to 42 of the Public Health Acts Amendment Act, 1907, in lieu of the sections of the Local Act, when a loan could be applied for to defray the cost of repayments to owners under those sections.

(5) Along with such privy conversion, replacement of dry ash-pits by movable receptacles should be encouraged and carried out more extensively.

(6) Scavenging, whether of middens or of ashpits, requires to be better supervised and more thoroughly and regularly carried out. A limit of two weeks for middens and one week for ashpits should never be exceeded.

(7) More attention should be paid to the condition of common lodging houses, and the bye-laws with respect to them should be strictly enforced.

(8) The existing abattoir should be materially enlarged, in order to satisfy the requirements of the borough. As the abattoir is increased, private slaughter houses, especially those badly situated in the centre of the borough, should be gradually reduced in number, as opportunities occur.

(9) Pig-styes should be more closely supervised, and their distance from houses carefully regulated.

(10) Hospital removal of enteric fever cases should be more urgently insisted upon; and, if necessary, the powers of section 124 of the Public Health Act, 1875, as to compulsory removal, should be employed. Care should be taken not to discharge patients from the hospital prematurely.

(11) Disinfection should be carried out more thoroughly: sulphur should be replaced by formalin: woodwork and walls should be dealt with: the clothing and bedding of every case of enteric fever should be disinfected by steam or by boiling.

(12) At least one assistant female health visitor should be appointed, in order to even more effectively carry out the present work of repressing infant mortality, and of supervising the work of the midwives in the borough, inasmuch as the present health visitor is largely employed in general sanitary inspection.

(13) The scavenging and disinfecting staff will need material increase when the recommendations relating to these matters are carried out.

(14) All unmade and filthy streets should be put into proper repair.

(15) Action with regard to nuisance abatement should be more promptly taken and more vigorously followed up.

(16) The medical officer of health should be regarded as the head of the sanitary department of the borough and all the officers of that department should be under his direction.

R. DEANE SWEETING.

APPENDIX I.

Number of privies converted into water closets from 1892 to November 14th, 1908:—

1892	...	...	...	...	27
1893	...	...	...	...	4
1894	...	...	...	...	12
1895	...	...	...	...	39
1896	...	...	...	...	33
1897	...	...	...	...	45
1898	...	...	...	...	54
1899	...	...	...	...	77
1900	...	...	...	...	94
1901	...	...	...	...	111
1902	...	...	...	...	227
1903	...	...	...	...	271
1904	...	...	...	...	314
1905	...	...	...	...	205
1906	...	...	...	...	289
1907	...	...	...	...	259
1908	...	...	...	...	249 (to November 14th).
Total ...					2,310

APPENDIX II.

ROTHERHAM CORPORATION ACT, 1904.

Section 98.

CONVERSION OF EXISTING CLOSET ACCOMMODATION INTO WATERCLOSETS.

(1.) When a sewer and water supply sufficient for the purpose are reasonably available the Corporation may by written notice to the owner of any building require any existing closet accommodation (other than a watercloset) provided at or in connection with such building to be altered so as to be converted into a watercloset which shall comply with the byelaws for the time being in force and shall communicate with a sewer and they may also require a separate receptacle for ashes and house refuse to be provided at or in connection with such building.

(2.) If the owner of any such building fail in any respect to comply with a notice from the Corporation under this section the Corporation may at the expiration of a time to be specified in the notice (not being less than twenty-one days after the service of the notice) do the work specified in such notice and may recover from the owner the expenses incurred by the Corporation

in so doing. Provided that if in any case such alteration shall be required in respect of any existing closet accommodation which prior to the service of the notice under this section shall not have been certified by the medical officer to be insufficient for the necessities of the inhabitants of the building or to be in such state as to create a nuisance or to be dangerous or injurious to health then the Corporation shall bear and pay such sum towards the expenses incurred by them (not less than one-half thereof) as the Corporation may consider just and proper according to the circumstances and the remainder of the expenses shall be borne by the owner.

(3.) The Corporation may contribute towards the expenses incurred in making any alteration of any closet accommodation in pursuance of this section in any case in which they may not be required to bear any part of such expense.

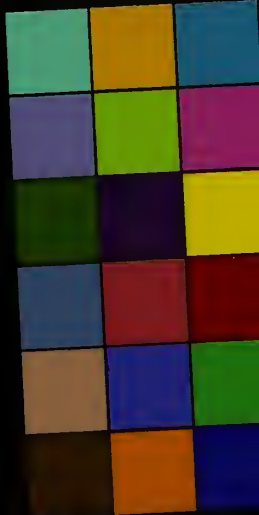
(4.) The notice under the provisions of this section shall state the effect of the provisions of this section.

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